

## **REMARKS**

### **Status of the Claims**

Claims 1-20 are pending in the application and have been rejected under 35 U.S.C. § 103(a) as being obvious over EP 1 361 243 A1 to Kodama et al. (“Kodama”) in view of U.S. patent no. 5,532,417 to Salek et al. (“Salek”).

### **Rejection Under 35 U.S.C. § 103(a)**

Claims 1-20 were rejected under 35 U.S.C. § 103(a) as being obvious over Kodama in view of Salek. According to the Examiner, Kodama “teaches a method of preparing oxytetramethylene glycol copolymer by copolymerizing tetrahydrofuran and neopentyl glycol in presence of heteropolyacid catalyst [see claim 2] and the preferred reaction temperature range of from 55 to 80°C [see 0083].” (Office Action, page 3). The Examiner admits that Kodama is “silent on the amount of impurities present either in the reactants or in the products.” (Id.)

Nonetheless, the Examiner asserts that “[o]ne skilled in the art would have been motivated to use a highly pure reagent in order to minimize the purification process of the final product. [Salek] clearly shows that high pure neopentyl alcohol was known prior to the filing of this application.” (Office Action, page 4). Applicants traverse this rejection.

Contrary to the Examiner’s assertion, a person having ordinary skill in the art would not be motivated to practice Applicants’ claimed invention based on the teachings of Kodama, alone or in combination with Salek. In particular, the disclosure of Kodama relied on by the Examiner – the use of distillation to remove unreacted diol – relates to purification of the *ultimate polymerization product*. In contrast, Applicants’ claimed process is directed to purifying neopentyl glycol, a *reactant*. In this regard, Kodama completely fails to teach or suggest any enhanced purification of any reactant, let alone purification of neopentyl glycol reactant *and*, in addition, with the specific focus of reducing the content of impurities of formula (I) as recited in

claim 1 to less than 1000 ppm.<sup>1</sup> In short, Kodama is not concerned about the amount of impurities of formula (I) contained in the neopentyl glycol reactant and contains no teaching or suggestion as to how to remove them.<sup>2</sup>

The Shortcomings of Kodama are not remedied by the disclosure of Salek. Salek contains no teachings or suggestions relating the use of its neopentyl glycol product, let alone the copolymerization of neopentyl glycol with tetrahydrofuran in order to form polyoxyalkylene glycols. Accordingly, a person having ordinary skill in the art would not be motivated to combine the teachings of Kodama with Salek because neither reference discloses any advantage to using highly purified neopentyl glycol (let alone as set forth in Applicants' claim 1) in copolymerization with tetrahydrofuran in order to form polyoxyalkylene glycols. Moreover, a person having ordinary skill in the art would not merely assume that such an advantage would exist, especially given the added cost involved in providing for a neopentyl glycol reactant of higher purity.

Moreover, Applicants have discovered that reducing the impurities of Formula I of claim 1 to less than 1000 ppm provides unexpected benefits, particularly with respect to the color number of the resulting polymer.<sup>3</sup> In this regard, Applicants direct the Examiner's attention to Example 1-4 and Comparative Examples 5-10 of the present application. In Comparative Examples 5-10, where commercial, technical grade neopentyl glycol was used (having more than 1000 ppm of impurities of Formula I) the average color number of the resulting polymers was 28.5. In contrast in Example 1-4, wherein purified neopentyl glycol having less than 1000 ppm of impurities of Formula I was used, the average color number was 9.75, an average color number nearly *three times lower* the average color number when commercial, technical grade

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<sup>1</sup> The Examiner's reliance on paragraph [0021] of Kodama (stating that "neopentyl glycol of 6-30% is used" (Office Action, page 3)) is misplaced. This mole percentage does not relate to the purity of the neopentyl glycol reactant but, instead, relates to the distribution of monomers within the ultimate copolymer *product* (i.e., 6 to 30mol% of the whole copolymer product are neopentyl glycol units).

<sup>2</sup> Kodama is not concerned about the amount of impurities in the neopentyl glycol reactant at least in part because Kodama does not correlate the amount of impurities a result effective variable in the quality of the resulting copolymer (let alone to correlate the amount of impurities of Formula (I) with the a parameter relating to the quality of the resulting copolymer, such as the color number of the resulting copolymer).

neopentyl glycol was used. Accordingly, for this additional reason Applicants submit that the claims are patentable over Kodama.

Applicant believes the pending application is in condition for allowance.

Applicants believe no fee is due with this response. However, if a fee is due, please charge our Deposit Account No. 22-0185, under Order No. 12810-00134-US1 from which the undersigned is authorized to draw.

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Respectfully submitted,

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<sup>3</sup> Applicants note that color is among the most important properties of a polymer which is to be used industrially (with a higher color number corresponding to a greater degree of undesirable discoloration).